COURSE OVERVIEW DE1011
ERD Drilling and Stuck Pipe Prevention

Course Title
ERD Drilling and Stuck Pipe Prevention

Course Date/Venue
May 11-15, 2025/Al Buraimi Meeting Room, Sheraton Oman Hotel, Muscat, Oman

Course Reference
DE1011

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with an up-to-date overview of ERD drilling and stuck pipe prevention. It covers the downhole forces including solid induced / formation collapse; the rock mechanics, mobile formation, fractured and faulted formation, naturally induced over-pressured shale collapse, reactive formation, poor hole cleaning and tectonically stressed formation problem prevention; the cavings versus drilling cuttings covering rock strength and brittleness, effects of increasing inclination and differing BHA's, borehole tortuosity data and interpretation, bridging and packing-off drilling fluids; the common causes of stuck; the various methods used in freeing differentially stuck pipe; and the drilling fluids optimization and selection of fluid type.

During this interactive course, participants will learn the mechanical and wellbore geometry sticking and how and why it happens; the effects of hole size, inclination, mud weight and plastic; the warning signs when circulating, tripping in, tripping out, running casing, making connections and reaming; the prevention of stuck pipe and fishing for parted pipe; the drill-string failures; the milling operations and milling applications; and the secondary freeing procedures including procedures for spotting pills and handling accelerators.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on ERD drilling and stuck piping prevention
- Discuss downhole forces including solid induced / formation collapse
- Describe rock mechanics, mobile formation, fractured and faulted formation, naturally induced over-pressured shale collapse, reactive formation, poor hole cleaning and tectonically stressed formation problem prevention
- Explain cavings versus drilling cuttings covering rock strength and brittleness, effects of increasing inclination and differing BHA's, borehole tortuosity data and interpretation, bridging and packing-off drilling fluids
- Identify the common causes of stuck and apply various methods used in freeing differentially stuck pipe
- Carryout drilling fluids optimization and selection of fluid type
- Discuss mechanical and wellbore geometry sticking and how and why it happens
- Recognize the effects of hole size, inclination, mud weight and plastic
- Identify the warning signs when circulating, tripping in, tripping out, running casing, making connections and reaming
- Apply prevention of stuck pipe and fishing for parted pipe
- Prevent drill-string failures and perform milling operations and milling applications
- Employ secondary freeing procedures including procedures for spotting pills and handling accelerators

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of ERD drilling and stuck pipe prevention for drilling engineers, senior drilling engineers, drilling superintendents, drilling managers, assistant drillers, drillers, toolpushers, senior toolpushers and service personnel.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Fee

US$ 8,000 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Instructor

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Ms. Diana Helmy, PgDip, MSc, BSc, is a **Senior Petroleum & Geologist** with extensive years of experience within the **Oil & Gas**, **Refinery** and **Petrochemical** industries. Her expertise widely covers in the areas of **Tubular & Pipe** Handling, **Tubular Strength**, **Casing & Tubing** Design, **Production/Injection Loads** for Casing Strings & Tubing, **Drilling** Loads, **Drilling & Production Thermal** Loads, **Well** Architecture, **Wellhead Integrity**, **Well Integrity & Artificial Lift**, **Well Integrity** Management, **Well** Completion & Workover, Applied **Drilling** Practices, Horizontal **Drilling**, **Petroleum** Production, **Resource & Reserve Evaluation**, **Reserves Estimation & Uncertainty**, Methods for **Aggregation of Reserves & Resources**, **Horizontal & Multilateral Wells**, **Well Completion & Stimulation**, **Artificial Lift System Selection & Design**, **Well** Testing & Oil Well Performance, **Well** Test Design Analysis, **Well Test** Operations, **Well Testing & Perforation**, **Directional** Drilling, **Formation Damage** Evaluation & Preventive, **Formation Damage** Remediation, **Drilling & Formation Damage**, Simulation Program for The **International Petroleum Business**, **Well** Testing & Analysis, **Horizontal & Multilateral Wells & Reservoir** Concerns, **Oil & Gas Analytics**, **Petrophysics & Reservoir Engineering**, **Subsurface Geology & Logging** Interpretation, **Petroleum Geology**, **Geophysics**, **Seismic** Processing & Exploration, **Seismic** Interpretation, **Sedimentology**, **Stratigraphy & Biostratigraphy**, **Petroleum Economy**, **Core** Analysis, Well Logging Interpretation, **Core Lab Analysis** & **SCAL**, **Sedimentary Rocks**, **Rock** Types, Core & Ditch Cuttings Analysis, Clastic, Carbonate & Basement Rocks, **Stratigraphic Sequences**, **Petrographically** Analysis, Thin Section Analysis, Scanning Electron Microscope (**SEM**), X-ray Diffraction (**XRD**), Cross-Section Tomography (**CT**), **Conventional & Unconventional** Analysis, **Porosity & Permeability**, **Geological & Geophysical** Model, **Sedimentary** Facies, **Formation Damage** Studies & Analysis, **Rig** Awareness, 2D&3D **Seismic** Data Processing, Static & Dynamic Correction, Noise Attenuation & Multiple Elimination Techniques, Velocity Analysis & Modeling and various software such as Petrel, OMEGA, LINUX, Kingdom and Vista. She is currently a **Senior Consultant** wherein she is responsible in different facets of **Petroleum & Process Engineering** from managing **asset integrity**, **well integrity process**, **pre-commissioning/commissioning** and **start up** onshore & offshore process facilities.

During her career life, Ms. Diana worked as a **Reservoir Geologist**, **Seismic Engineer**, **Geology Instructor**, **Geoscience Instructor & Consultant** and **Petroleum Geology Researcher** from various international companies like the **Schlumberger**, Corex Services for Petroleum Services, Petrolia Energy Supplies and Alexandria University.

Ms. Diana has a **Postgraduate Diploma** in **Geophysics**, **Master's** degree in **Petroleum Geology** and **Geophysics** and a **Bachelor's** degree in **Geology**. Further, she is a **Certified Trainer/Assessor/Internal Verifier** by the **Institute of Leadership & Management** (**ILM**) and has delivered numerous trainings, courses, workshops, seminars and conferences internationally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: ***Sunday, 11th of May 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 - 0930	***Introduction to Downhole Forces*** *Surface / Mudline • Mobile Formation Movement • Fractured Formation Collapse • Reactive Clays & Shales • Tectonic Stress • Overburden Forces • Overpressure • Un-Consolidation • Contamination & Fracture • Differential Forces*
0930 - 1030	***Solids Induced / Formation Collapse*** *Pack-Off Indicators • Bridging Indicators*
1030 – 1035	*Break*
1035 – 1230	***The Driller's First Actions on Becoming Stuck*** *Rock Mechanics & Problem Prevention: • Mobile Formation Problem Prevention • Fractured & Faulted Formation Problem Prevention • Naturally Over-pressured Shale Collapse Problem Prevention • Induced Over-pressured Shale Collapse Problem Prevention • Reactive Formation Problem Prevention • Poor Hole Cleaning Problem Prevention • Tectonically Stressed Formation Problem Prevention*
1230 – 1235	*Break*
1235 – 1420	***Cavings Versus Drilled Cuttings*** *What Cavings tell us • Rock Strength & Brittleness • Effects of Increasing Inclination • Effects of Differing BHA's • Borehole Tortuosity Data & Interpretation • Bridging • Packing-off Drilling Fluids*
1420 – 1430	***Recap***
1430	*End of Day One*

Day 2:	Monday, 12th of May 2025
0730 – 0930	***Stuck Pipe Mechanisms Objectives*** *Observations • The Common Causes of Stuck • Identify the Cause • Differential Sticking • Differentially Stuck Pipe • Differentially Sticking Spreadsheet • Preventative Action • Methods Used in Freeing Differentially Stuck Pipe • Differential Sticking Force • Using Lubricators • Jarring the Pipe Loose • "U" Tube Technique • Differential Sticking Operational Procedures • Unconsolidated Formations • Preventative Actions • Filtrate Reducers • Key Seat • Surface Jars • Preventive Action • Standard Single Clutch Key Seat Wiper • Standard Double Clutch Key Seat Wipe*
0930 – 0935	*Break*
0935 – 1130	***Drilling Fluids Optimization & Selection of Fluid Type*** *Rheology • Gels • Inhibition •Well Bore Stability/Inhibition • Inadequate Hole Cleaning • Mud Lubricity - Torque & Drag Reduction • Filtration Control/Differential Sticking • Solids Control Management • Torque & Drag • String Torque • Mechanical Torque Factors • Bit Torque*
1130 - 1300	***Mechanical & Wellbore Geometry Sticking How & Why It Happens*** *The Driller's First Actions on Becoming Stuck Key Mechanisms &Prevention • Key-seating – & how to Prevent It • Shoe Joint Backs Off – & how to Prevent • Under-gauge Hole – & how to Prevent • Ledges – & how to Prevent • Dog-legs – & how to Prevent • Micro Dog-legs – & how to Prevent • Collapsed Casing – & how to Prevent*
1300 - 1315	*Break*
1315 - 1420	***Mechanical & Wellbore Geometry Sticking How & Why It Happens (cont'd)*** *Green Cement – & how to Prevent • Cement Blocks – & how to Prevent • Junk – & how to Prevent • Optimized Hole Cleaning Key Considerations • The Problems Associated with Poor Hole Cleaning • Those Parameters which Assist with Hole Cleaning that are Within the Rig Crew's Control • Why Problems Increase with Increasing Inclination*
1420 – 1430	***Recap***
1430	*End of Day Two*

Day 3:	Tuesday, 13th of May 2025
0730 – 0930	***Mechanical & Wellbore Geometry Sticking How & Why It Happens (cont'd)*** *Barite Sag General Factors Affecting Hole Cleaning • Rig-Site Monitoring • Vertical & Near Vertical Wells • High Angle & Extended Reach Wells High Angle & Extended Reach Wells & MRC • Characteristics of Cuttings Beds • Flow Regime: Plug Flow, Laminar Flow & Turbulent Flow • Hydraulics • Pills • Drill-string Movement • Back-Reaming • Use of Larger OD Drill Pipe • Circulation Prior to Connections or Tripping • Wiper Trips • Trend Interpolation • Using Hole Cleaning Charts*
0930 – 0935	*Break*

0935 – 1130	***Mechanical & Wellbore Geometry Sticking How & Why It Happens (cont'd)*** *The Effects of Hole Size, Inclination, Mud Weight, Plastic •Viscosity, Yield Point, ROP Pressure Profiling & Virtual Hydraulics • ECD • Swab & Surge • Hole Cleaning Simulator Exercise for Jarring & Stuck Release • Best Practices Review of Stuck Pipe Mechanism Flow Charts• Warning Signs when Circulating • Warning Signs when Tripping In • Warning Signs when Tripping Out • Warning Signs when Running Casing • Warning Signs when Making Connections • Warning Signs when Reaming*
1130 - 1300	***Prevention of Stuck Pipe During*** *Reaming & Back-reaming • Tripping in Deviated Holes • Connections • MWD Surveys • Drilling Parameter Trends • Running Casing & Liners • Coring • Well Control • Lost Circulation • Air & Foam Drilling • Drilling with Coiled Tubing • Fishing for Junk Best Fishing Procedures • Ways to Fish for Junk • Fishing Magnet • Running Magnets • Weatherford Type P Boot Basket • Finger Catchers • Operation: Core Basket • Core Type Basket • Reverse Circulation/Jet Junk Basket • Venturi Jet Junk Basket • Venturi Jet System • Junk Shot • Poor Boy Basket • Finger Type Shoe • Dimple Type Shoe • Spring Tine Type Shoe • Spring Tine Basket*
1300 - 1315	*Break*
1315 - 1420	***Fishing for Parted Pipe & How the Pipe Parted*** *Causes of Parted Pipe • Planning the Fishing Job • Lead Blocks Parted Pipe • Dress & Catch Fish in Trip • Tapered Mill Guide • Skirted Mill • Bottom Hole Assembly Options • Desirable Characteristics for an Attachment Tool • Screw In • Screw in Accessory • Overshots • Packoffs • Spears & Accessories • Reversing Tool • Taps*
1420 – 1430	***Recap***
1430	*End of Day Three*

Day 4: ***Wednesday, 14th of May 2025***

0730 – 0930	***Preventing Drill-string Failures*** *Care of Tubulars • Identify Corrosion • Identifying Galled Threads • Shock, Vibration & Twist-off.*
0930 – 0935	*Break*
0935 – 1130	***Milling Operations & Milling Applications*** *Milling Rotary Speeds • Weight on Mills • Optimizing Cutting Returns • Junk Milling Operations • Mud Conditioning for Milling • How to Read Cuttings*
1130 - 1300	***Milling Operations & Milling Applications (cont'd)*** *Some Factors that Affect Milling Rates • What to do About Rubber in the Hole? • Stabilizing the Mill•What to do About Rough Operation? • Mills • Cone Buster/Flat Bottom Mills*
1300 - 1315	*Break*
1315 - 1420	***Milling Operations & Milling Applications (cont'd)*** *Bladed Mill • Insert Dressed Bladed Junk Mill • Pilot Mill/Lower Connection Type • Milling Rates: Surface Feet/Minute • Bowen Ditch Magnets • Mills Revie*
1420 – 1430	***Recap***
1430	*End of Day Three*

Day5: ***Thursday, 15th of May 2025***

0730 – 0930	***Secondary Freeing Procedures*** *Pipe Release Agents • Procedures for Spotting Pills • Acid • Fresh Water Pills • Backing-off • Jars &Accelerators Mechanical & Hydraulic Jars • Types of Drilling Jars • Mechanical Jars – Design & how they Work • Hydraulic Jars – Design & how they Work*
0930 – 0945	*Break*
0945 - 1100	***Secondary Freeing Procedures (cont'd)*** *Successful Usage • Forces Required to Fire • Jar Firing Force Envelope • Pump-Open Force – What it is; Advantages & Disadvantages •Jar Descriptions • Handling Accelerators • What They are, What They do & how They Work Jar & Accelerator Positioning*
1100 - 1200	***Secondary Freeing Procedures (cont'd)*** *Key Considerations • Tension Versus Compression • Computer Programs • Varying Neutral Point • Considerations Jarring Calculations • Minimum Overpull • Maximum Overpull*
1200 – 1215	*Break*
1215 – 1345	***Secondary Freeing Procedures (cont'd)*** *Slack-off • Neutral Point • DC's Above Jars • Down Jarring • Up Jarring • Limits Communications & Teamwork • The Typical Outcomes of Poor Teamwork • Cost to the Industry*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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